

# Capitol Lake Milfoil Control Project

## Monitoring Report

For Washington Department of General Administration  
By Thurston County Public Health and Social Services  
September 2004

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### Background

During July 2004 the Washington Department of General Administration (GA) contracted with AquaTechnex to treat Capitol Lake with the herbicide Renovate® (active ingredient: triclopyr) in an effort to control the noxious weed, Eurasian water milfoil. Part of the milfoil control project included monitoring to determine the effectiveness of the treatment, the dissipation of the triclopyr, and the impact of dying and decaying milfoil plants on water quality. A monitoring plan was prepared by Thurston County Public Health and Social Services Department, Environmental Health Division, in June 2004. The monitoring plan was accepted on July 1, 2004 by the Committee that assists GA in the management of Capitol Lake.

Monitoring for the project included the following activities:

- Dissolved Oxygen and pH sampling – pre- and post-treatment
- Triclopyr sampling of lake and marine water - pre- and post-treatment
- Triclopyr sampling of lake sediments - pre- and post-treatment
- Triclopyr sampling of groundwater - pre- and post-treatment
- “Frequency of Occurrence” sampling of the aquatic plant community – pre- and post- treatment
- Biomass sampling of aquatic plant community – pre- and post-treatment

To minimize the possible effect of the herbicide treatment on dissolved oxygen and pH levels, the treatment was divided into two separate applications. The first application was done in areas of the south and middle basins on July 19<sup>th</sup>. A second application was done in the north basin on July 29th.

To minimize the amount of herbicide that flowed into Budd Inlet, GA closed the tide gates at the lake outlet for 72 hours following each treatment. During the second application one of the tide gates remained partially open during a portion of the application that day. In response, additional samples were collected in Budd Inlet near the lake outlet that day.

The water quality sampling was coordinated by Thurston County Environmental Health Division staff. City of Olympia staff assisted in the field data collection and report preparation. Port of Olympia staff assisted in the marine water sampling. Washington Department of Ecology conducted the pre-treatment aquatic plant survey and collected continuous water quality data near the lake outlet. Thurston County Department of Water and Waste Management staff conducted the post-treatment aquatic plant survey.

A map is attached showing the monitoring sites for the project. The monitoring data is included in the appendix, and the triclopyr results in the appendix are recorded in parts per billion. The aquatic plant survey results will be reported to GA in a separate document.

# **Summary of Monitoring Results**

The triclopyr herbicide treatment in Capitol Lake caused little change in summer time dissolved oxygen and pH conditions. Because of its highly productive state, this lake already had wide fluctuations of pH and dissolved oxygen prior to herbicide application, as well as high summer temperatures and nutrients levels. A substantial blue-green algae bloom occurred in August, and was likely triggered by the availability of excess nutrients. Nutrients were likely being released into the water column by dying milfoil plants, and nutrients already in the water column were no longer being utilized by what had been vigorously growing milfoil plants. Because Capitol Lake is a nutrient-rich system, it will continue to support algae blooms, however, it may be less severe next year as native plants re-establish in formerly milfoil-dominated areas and a balance is reached.

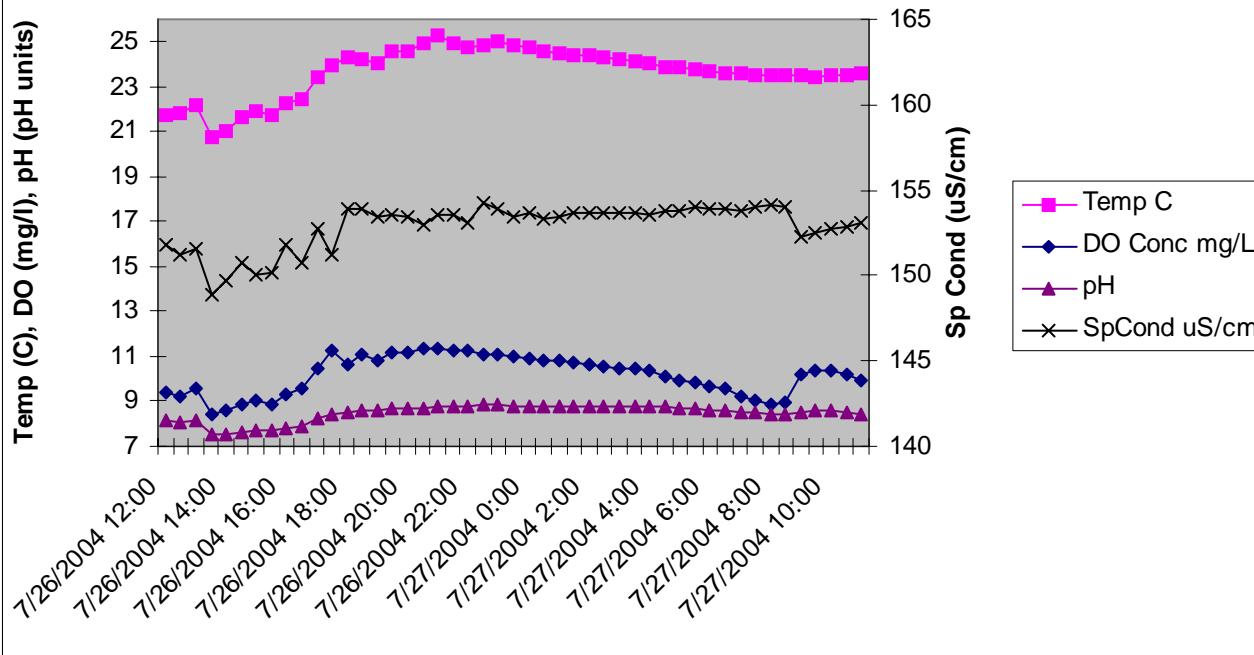
The triclopyr concentration in the treated basins decreased approximately ten-fold within the two weeks following each treatment. Based on the dissipation rate seen, it is likely that triclopyr would be undetectable in the water column within a few weeks. Triclopyr concentrations in Budd Inlet samples were all low (Less than 0.065 ppm).

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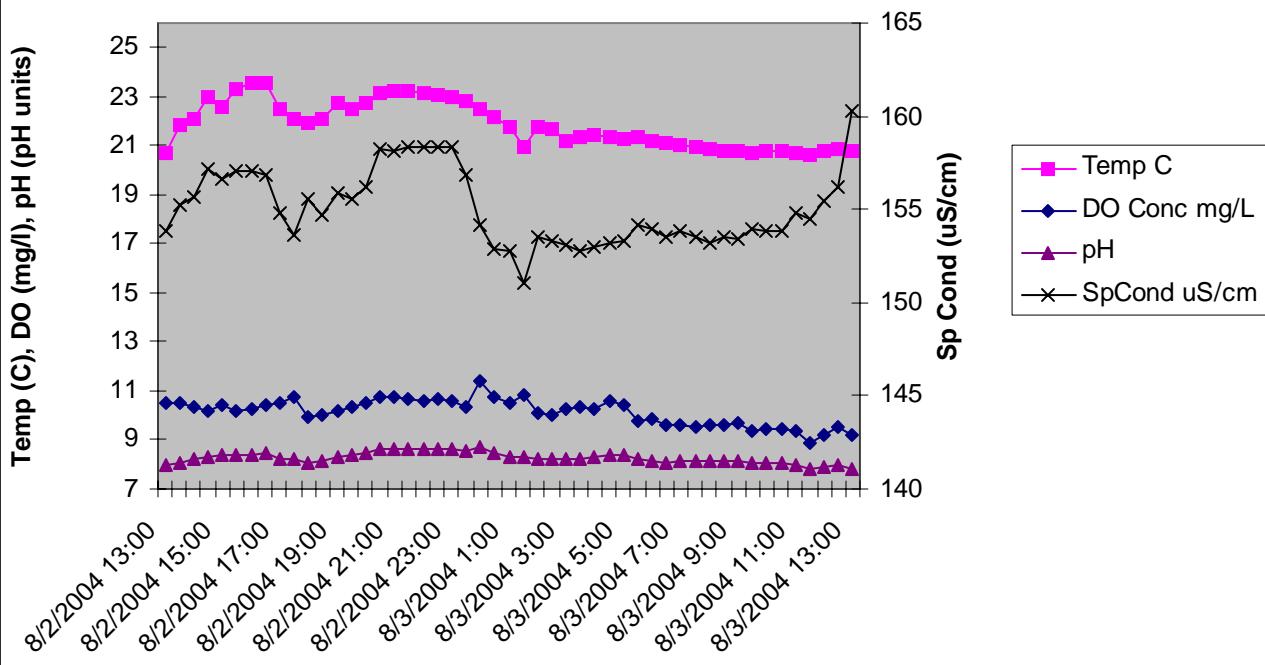
## **Dissolved Oxygen and pH Levels**

- 24-hour monitoring in an area of herbicide-treated milfoil plants in the middle basin was conducted one and two weeks after the first application (July 26-27 and August 2-3). Dissolved oxygen ranged from 8.4 to 11.4 mg/l, which was 94 to 138 percent saturation. The overall average dissolved oxygen for the two 24-hour periods was 10.1 mg/l. pH levels ranged from 7.5 to 8.8.
- Washington Department of Ecology placed a continuous recording device in the north basin next to the tide gate at the lake outlet for the period from July 13 to August 12. Dissolved oxygen ranged from 6.7 to 16.9 mg/l with an average of 10.5 mg/l. pH ranged from 8.5 to 10.6 with a median value of 9.4.
- Fluctuation of pH and dissolved oxygen levels after the herbicide treatment appear to be similar to the range seen under normal conditions during the summer of 2003.
- A blue-green algal bloom occurred in August and was likely stimulated by nutrients made available as a result of decaying milfoil and the lack of nutrient uptake by milfoil plants. The highest dissolved oxygen and pH levels were seen during the algae bloom in August.
- Dissolved oxygen concentrations were above the minimum level for salmon rearing and migration (6.5 mg/L) before and after treatment, except for two measurements at the lake bottom in the north basin before treatment.
- Dissolved oxygen measurements taken in the deep area on the lake side of the tide gate showed that oxygen was present in the water at the bottom. The only exceptions were during the 72-hour periods following the herbicide treatments when the tide gates were closed and the siphon shut down.

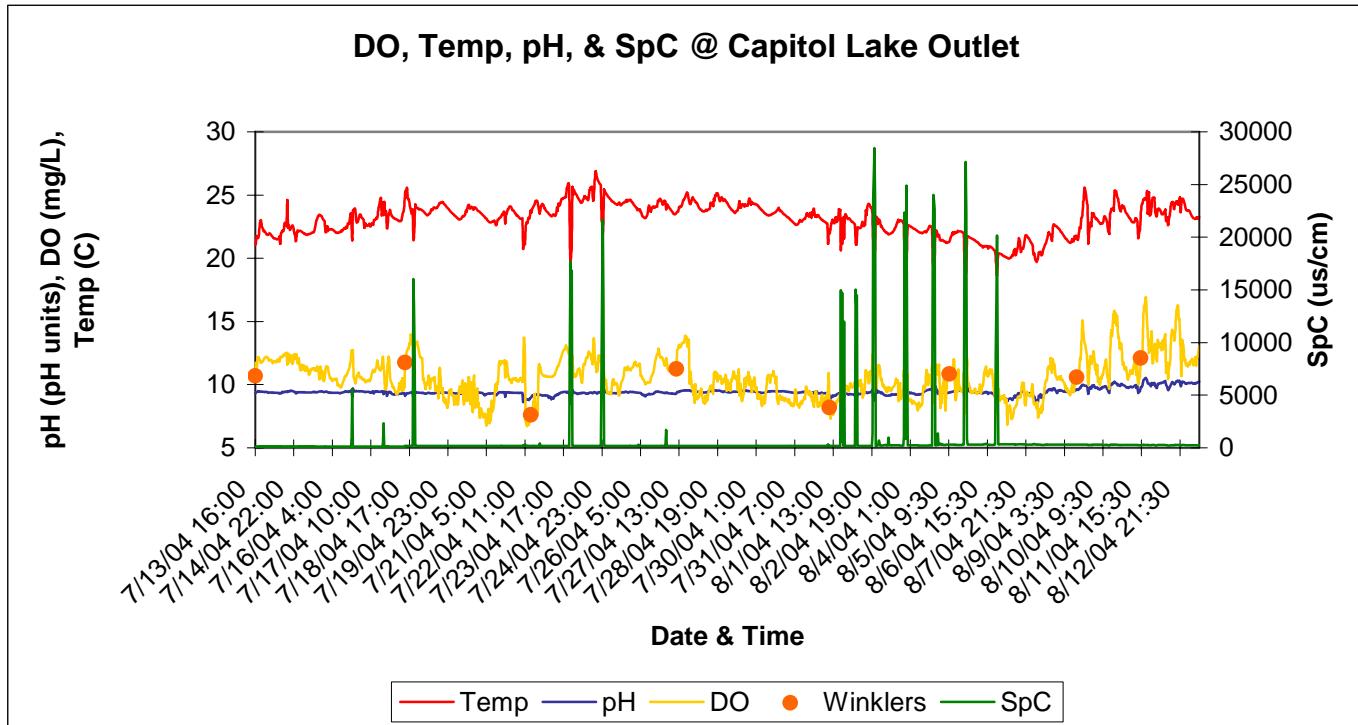
**24-Hour Capitol Lake Monitoring  
Middle Basin**



**24-Hour Capitol Lake Monitoring  
Middle Basin**



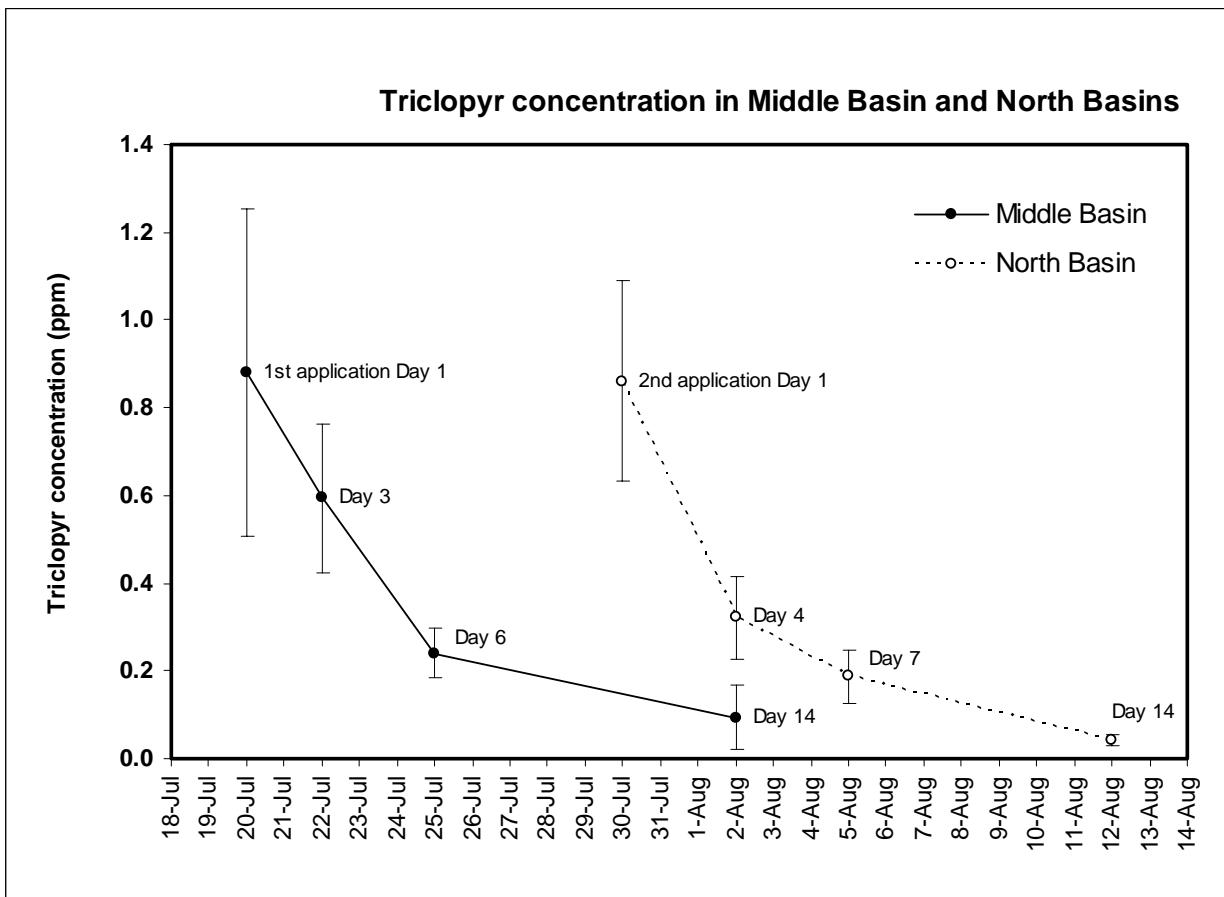
The graph below show the temperature, pH, dissolved oxygen, and specific conductance data measured by a continuous recording instrument located at the lake outlet next to the tide gate from July 13 through August 12, 2004. This data was collected by the Washington Department of Ecology.



## Dissipation of Triclopyr

- The maximum detected concentration of triclopyr was within the manufacturer's application limit of 2.5 ppm.
- Triclopyr concentrations decreased rapidly during the sampling interval (See figure on page 5).
- Triclopyr was detected in the freshwater layer over marine water in Budd Inlet. After the tide gate was opened (day 3) triclopyr concentrations ranging from 0.021 – 0.048 ppm were detected. On the final day of sampling (24 days from 1<sup>st</sup> and 14 days from the 2<sup>nd</sup> applications), concentrations ranging from 0.002 – 0.009 ppm were detected in Budd Inlet samples.
- Samples collected seaward of the tide gate shortly after the 2<sup>nd</sup> application, when a tide gate had been ajar, had triclopyr concentrations of 0.065 and 0.054 ppm at the 4<sup>th</sup> Avenue bridge and Olympia Yacht Club dock, respectively. These values were significantly lower than those measured in the lake on that day.
- No triclopyr was detected in the shallow monitoring well next to the Heritage Park fountain 27 days after the second herbicide treatment in the lake.

- Triclopyr concentrations in the lake sediments ranged from 0.055 to 0.690 ppm in four composite samples. The lowest concentrations were seen in the two middle basin samples, taken on day 35 days after the middle basin treatment. The north basin samples, collected 25 days after the north basin treatment, were slightly higher.



Note: Graph prepared by Roy Iwai, City of Olympia, September 2004.

The graph above shows the average triclopyr concentrations from the middle and north basin sites for the two applications. Error bars denote one standard deviation.

## Effectiveness of herbicide treatment

The pretreatment “Frequency of Occurrence” and biomass sampling of the aquatic plant community survey was performed on the week of July 12<sup>th</sup> by Washington Department of Ecology staff. The post treatment survey was conducted the week of September 13<sup>th</sup> by Thurston County Department of Water and Waste Management staff. Both of these surveys were done following the aquatic plant sampling protocols as specified in the monitoring plan. Thurston County and Ecology will provide the results to GA when completed.

## **Appendix**

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CAPITOL LAKE  
July 26 - 27, 2004  
-- Statistical Report --

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From 07/26/04 12:00 to 07/27/04 11:00  
Number of samples: 47

Parameter	Min	Max	Mean	Std
Temp (C)	20.78	25.25	23.64	1.11
DO Conc (mg/L)	8.40	11.39	10.17	0.85
SpCond (uS/cm)	149	154	153	1.3
pH	7.53	8.84		

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CAPITOL LAKE 24-HOUR WATER QUALITY DATA					
	Date	Time	Temp	DO (mg/L)	SpCond (uS/cm)
1	07/26/04	12:00:40	21.77	9.40	152
2	07/26/04	12:30:40	21.85	9.23	151
3	07/26/04	13:00:40	22.20	9.60	152
4	07/26/04	13:30:40	20.78	8.40	149
5	07/26/04	14:00:40	21.00	8.56	150
6	07/26/04	14:30:40	21.62	8.87	151
7	07/26/04	15:00:40	21.94	9.03	150
8	07/26/04	15:30:40	21.77	8.85	150
9	07/26/04	16:00:40	22.23	9.28	152
10	07/26/04	16:30:40	22.49	9.61	151
11	07/26/04	17:00:40	23.46	10.47	153
12	07/26/04	17:30:40	23.94	11.23	151
13	07/26/04	18:00:40	24.27	10.66	154
14	07/26/04	18:30:40	24.19	11.12	154
15	07/26/04	19:00:40	24.05	10.85	153
16	07/26/04	19:30:40	24.62	11.14	154
17	07/26/04	20:00:40	24.60	11.14	153
18	07/26/04	20:30:40	24.97	11.39	153
19	07/26/04	21:00:40	25.25	11.37	154
20	07/26/04	21:30:40	24.92	11.30	154
21	07/26/04	22:00:40	24.73	11.23	153
22	07/26/04	22:30:40	24.87	11.07	154
23	07/26/04	23:00:40	25.04	11.04	154
24	07/26/04	23:30:40	24.84	10.96	153
25	07/27/04	00:00:40	24.74	10.89	154
26	07/27/04	00:30:40	24.59	10.81	153
27	07/27/04	01:00:40	24.51	10.81	153
28	07/27/04	01:30:40	24.44	10.77	154
29	07/27/04	02:00:40	24.39	10.61	154
30	07/27/04	02:30:40	24.29	10.55	154
31	07/27/04	03:00:40	24.20	10.45	154
32	07/27/04	03:30:40	24.13	10.45	154
33	07/27/04	04:00:40	24.03	10.39	154
34	07/27/04	04:30:40	23.91	10.15	154
35	07/27/04	05:00:40	23.84	9.90	154

36	07/27/04	05:30:40	23.76	9.82	154	8.7
37	07/27/04	06:00:40	23.70	9.67	154	8.6
38	07/27/04	06:30:40	23.63	9.56	154	8.6
39	07/27/04	07:00:40	23.58	9.26	154	8.5
40	07/27/04	07:30:40	23.52	9.02	154	8.5
41	07/27/04	08:00:40	23.50	8.90	154	8.4
42	07/27/04	08:30:40	23.51	8.97	154	8.4
43	07/27/04	09:00:40	23.48	10.21	152	8.5
44	07/27/04	09:30:40	23.46	10.39	152	8.6
45	07/27/04	10:00:40	23.50	10.38	153	8.6
46	07/27/04	10:30:40	23.49	10.24	153	8.6
47	07/27/04	11:00:40	23.57	9.94	153	8.4

CAPITOL LAKE  
August 2 - 3, 2004  
-- Statistical Report --

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From 08/02/04 13:00 to 08/03/04 13:00

Parameter	Min	Max	Mean	Std
Temp (C)	20.65	23.55	21.84	0.93
DO Conc (mg/L)	8.84	11.44	10.13	0.53
SpCond (uS/cm)	151	160	155	2.0
pH	7.8	8.7		

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Date M/D/Y	Time	Temp C	DO Conc mg/L	SpCond uS/cm	pH
08/02/04	13:00:40	20.73	10.47	154	8.0
08/02/04	13:30:40	21.88	10.48	155	8.1
08/02/04	14:00:40	22.09	10.35	156	8.2
08/02/04	14:30:40	22.98	10.16	157	8.3
08/02/04	15:00:40	22.54	10.39	157	8.4
08/02/04	15:30:40	23.27	10.21	157	8.4
08/02/04	16:00:40	23.55	10.25	157	8.4
08/02/04	16:30:40	23.55	10.43	157	8.4
08/02/04	17:00:40	22.49	10.51	155	8.2
08/02/04	17:30:40	22.08	10.72	154	8.3
08/02/04	18:00:40	21.93	9.94	157	8.1
08/02/04	18:30:40	22.07	9.98	155	8.2
08/02/04	19:00:40	22.73	10.15	156	8.3
08/02/04	19:30:40	22.49	10.32	156	8.4
08/02/04	20:00:40	22.71	10.54	156	8.5
08/02/04	20:30:40	23.14	10.72	158	8.6
08/02/04	21:00:40	23.19	10.73	158	8.6
08/02/04	21:30:40	23.25	10.65	158	8.6
08/02/04	22:00:40	23.14	10.62	158	8.6
08/02/04	22:30:40	23.05	10.65	158	8.7
08/02/04	23:00:40	22.99	10.62	158	8.6
08/02/04	23:30:40	22.86	10.33	157	8.5
08/03/04	00:00:40	22.50	11.44	154	8.7
08/03/04	00:30:40	22.13	10.73	153	8.5
08/03/04	01:00:40	21.77	10.48	153	8.3
08/03/04	01:30:40	20.93	10.86	151	8.3
08/03/04	02:00:40	21.79	10.09	154	8.2
08/03/04	02:30:40	21.64	10.00	153	8.2
08/03/04	03:00:40	21.22	10.29	153	8.2
08/03/04	03:30:40	21.33	10.35	153	8.3
08/03/04	04:00:40	21.46	10.29	153	8.3
08/03/04	04:30:40	21.35	10.59	153	8.4
08/03/04	05:00:40	21.28	10.41	153	8.4
08/03/04	05:30:40	21.39	9.74	154	8.2
08/03/04	06:00:40	21.22	9.83	154	8.2
08/03/04	06:30:40	21.09	9.60	154	8.1
08/03/04	07:00:40	21.04	9.60	154	8.1
08/03/04	07:30:40	20.96	9.52	154	8.2
08/03/04	08:00:40	20.87	9.63	153	8.2

08/03/04 08:30:40	20.78	9.63	154	8.1
08/03/04 09:00:40	20.80	9.68	153	8.2
08/03/04 09:30:40	20.72	9.40	154	8.1
08/03/04 10:00:40	20.76	9.45	154	8.1
08/03/04 10:30:40	20.77	9.45	154	8.1
08/03/04 11:00:40	20.70	9.33	155	8.0
08/03/04 11:30:40	20.65	8.84	154	7.8
08/03/04 12:00:40	20.75	9.23	155	7.9
08/03/04 12:30:40	20.83	9.54	156	8.0
08/03/04 13:00:40	20.77	9.19	160	7.8

Capitol Lake Milfoil Treatment Project  
 Dissolved Oxygen Measurements in Scour Hole near Tide Gate  
 Thurston County Environmental Health Division  
 June 30, 2004

Date	Time	Description	Depth (meters)	Temp degrees C	pH	DO (mg/L)	Cond (uS/cm)	Salinity (ppt)	Lake Level Gage Reading (feet)
6/30/2004	9:30	Tide Gate	0	21.7	8.9	12.04	184	0.09	6
			2	20.52	8.5	11.8	190	0.09	
			4	19.53	8.2	9.01	440	0.4	
			6	18.79	7.4	6.17	19600	11.7	
			8	18.46	7.4	4.54	20600	12.3	
			9.1 (bottom)	18.36	7.3	3.36	20700	12.4	

**Pre-Treatment Results**  
**July 13, 2004**

Date	Time	Sample ID	Description	Depth (meters)	Temp degrees C	pH	DO (mg/L)	Cond (uS/cm)	Salinity (ppt)	Triclopyr (ppb)	% Solids	SWL (feet)
7/13/2004	12:30	CAP020713	Heritage Park	0	23.14	9.1	12.75	211			ND	
				1	21.35	9.2	13.8	214				
				2	19.73	8.9	14.97	383				
				2.5	19.01	7.6	4.52	437				
7/13/2004	10:40	CAP010713	Tide Gate	0	21.64	9.4	13.26	198	0.1		ND	
				2	19.34	8.7	11.51	211	0.1			
				4	17.83	8.1	9.4	490	0.2			
				5.4	18.07	7.2	3.12	22500	14			
7/13/2004	9:45	CAP030713	Just north of I-5 bridge	0	22.6	8.7	11.93	142	0		ND	
				0.9	17.76	8.1	9.14	143				
7/13/2004	8:10	BUD030713	Off Priest Point	0		7.9	10.35		21		ND	
				1		8	11.28		27			
7/13/2004	7:40	BUD010713	Out from Port dock near Anthony's	0	17.97	7.9	10.25		10-15		ND	
				1	17.89	7.9	12.66		28			
7/14/2004	9:20	MW60714	Heritage Pk monitoring well # 6		14	7.2		594			ND	5.69
7/13/2004	11:15- 11:45	NOW0713	Sediment composite from north basin west shore								ND	30
7/13/2004	12:00	NOE0713	Sediment composite from north basin east shore								ND	33.5
7/13/2004	13:15	MidE0713	Sediment composite from middle basin east shore								ND	43.9
7/13/2004	14:00	MidW0713	Sediment composite from middle basin west shore								ND	30.9

Time	Sample ID	Description	Day 0 – First Treatment July 19, 2004							Triclopyr (ppb)	Field Dup. (ppb)
			Depth (meters)	Temp (degrees C)	pH	DO (mg/L)	Cond uS/cm	Salinity (ppt)			
16:52	012	No.0719 Heritage Park	0	24.82	9.1	12.39	188			ND	
			1	24.84	9.2	12.56	188				
17:05	006	No. 0719 Tide Gate	0	24.4	9.2	12.13	177			ND	
			2	24.15	9.2	12.76	179	0.08			
			4	20.68	7.9	7.25	3600	1.9			
			5.6	19.77	7.4	3.87	20000	11.9			
17:20	007	No.0719 In front of brick house along Pkwy	0	24.52	9.2	12.82	180			ND	
			1	23.4	9.3	15.96	179				
			2	21.53	8.9	12.65	272	0.013			
17:40	019	Mid.0719 RR tressel in middle basin	0	24.43	9.2	12.95	175			7.5	
			1	24.42	9.2	13.03	172				
			2	20.72	8.2	10.02	146				
			3	19.63	8	8.85	156				
17:50	017	Mid.0719 Across from Percival Cove near D. Pkwy	0	24.68	8.9	11.86	155			1170	
			1	24.08	8.8	11.81	156				
			1.9	21.79	8.3	8.75	154				
18:10	020	Mid.0719 So. Of Pt.on W. shore near Interpretive Center	0	24.89	9	13.6	146			2180	
			0.8	24.54	8.9	13.56	147				
18:20	013	Mid.0719 Just north of I-5 bridge	0	24.14	9	12.6	148			443	536
			1	19.75	8.3	10.66	145				
18:50	021	So. Basin by boat launch	0	23.55	8.6	11.68	148			366	
			0.8	21	8.2	11.23	146				

**Day 1 – First Treatment**  
**July 20, 2004**

Date	Time	Sample ID	Description	Depth (meters)	Temp degrees C	pH	DO (mg/L)	Cond (uS/cm)	Sal (ppt)	Triclopyr (ppb)
7/20/2004	14:50	012No.0720	Heritage Park	0	24.34	9.1	12.44	187	0.09	ND
				1	24.18	9.2	12.46	185	0.09	
7/20/2004	15:00	006No.0720	Tide Gate	0	24.11	9.2	12.67	179	0.08	ND
				2	21.26	8.8	14.2	180	0.08	
				4	19.99	7.9	7.32	660	0.32	
				6	19.34	7.2	4.12	20200	12	
				8	17.76	7.2	0.28	23500	14	
				8.9	17.7	7.2	0.15	23900	15	
7/20/2004	15:20	007No.0720	In front of brick house along Pkwy	0	23.98	9.2	14.05	179	0.08	ND
				1	23.42	9.3	14.28	176	0.08	
				2	21.73	8.5	10 - 13	280	0.13	
				2.3 Bottom						
7/20/2004	15:35	019Mid.0720	RR tressel in middle basin	0	24.21	9	13.14	159	0.07	604
				1	24.19	9	13.01	159	0.07	
				2	20.4	8.2	10.15	150	0.07	
				3	19.71	7.9	8.28	147	0.07	
7/20/2004	15:50	017Mid.0720	Across from Percival Cove near D. Pkwy	0	24.43	8.7	11.31	153	0.07	1420
				1	23.17	8.9	12.4	156	0.07	
				1.6	22.15	7.9	9.36	153	0.07	
7/20/2004	16:00	020Mid.0720	So. Of Pt.on W. shore near Interpretive Center	0	24.33	8.6	11.66	148	0.07	1100
				0.8	23.42	8.7	13.14	147	0.07	
7/20/2004	16:15	013Mid.0720	Just north of I-5 bridge	0	23.92	8.8	12.5	148	0.07	757
				1	19.52	8	10.15	146	0.07	
7/20/2004	16:20	021So.0720	So. Basin by boat launch	0	23.7	8.5	11.67	144	0.07	524
				0.7	22.26	7.7	8.62	152	0.07	

**Day 3 – First Treatment**

**July 22, 2004**

Date	Time	Sample ID	Description	Depth (meters)	Temp degrees C	pH	DO (mg/L)	Cond (uS/cm)	Salinity (ppt)	Triclopyr (ppb)	Field Dup (ppb)
7/22/2004	10:30	012No.0722	Heritage Park	0	23.18	9.2	14.24	182	0.09	18.3*	
				1	23.05	9.2	14.09	186	0.09		
				2	21.07	8.8	15.86	301	0.14		
7/22/2004	10:45	006No.0722	Tide Gate	0	22.88	9.1	14.2	180	0.08	88.5*	85.8
				2	22.44	8.9	13.02	220	0.1		
				4	20.69	7.9	9.4	1300-1700	0.88		
				6 Current too strong-YSI wouldn't hang down							
7/22/2004	10:55	007No.0722	In front of brick house along Pkwy	0	23.83	9.2	13.51	180	0.08	65.2*	
				1	23.34	9.1	13.73	174	0.08		
				2	20.77	8.2	10.59	335	0.16		
7/22/2004	10:15	019Mid.0722	RR tressel in middle basin	0	23.57	8.8	13.83	157	0.07	517*	
				1	23.39	8.9	13.35	164	0.08		
				2	22.97	8.8	12.67	160	0.07		
				3	21.37	8.2	11.44	150	0.07		
				3.3 Bottom							
7/22/2004	9:20	017Mid.0722	Across from Percival Cove near D. Pkwy	0	23.27	9	13.46	162		443*	
				1	23.05	9	13.33	161	0.08		
				1.9	20.98	8	6.98	149	0.07		
7/22/2004	9:40	020Mid.0722	So. Of Pt.on W. shore near Interpretive Center	0	23.27	8.6	11.66	154	0.07	740*	
				0.8	23.32	8.6	11.68	154	0.07		
7/22/2004	9:45	013Mid.0722	Just no. of I-5 bridge	0	22.65	8.6	12.25	149	0.07	808*	
				1	19.15	7.9	9.53	147	0.07		
7/22/2004	9:55	021So.0722	So. Basin by boat launch	0	20.68	7.6	8.5	152	0.07	461*	
				0.7	19.83	7.5	8.65	147	0.07		
7/22/2004	12:25	005Bud.0722	Northern most site near Gull Harbor	0	21.12	8	8.2	31000	20	27.3*	
				1	21.48	8.7	8.7	43000	28		

**Continued**  
**Day 3 – First Treatment**  
**July 22, 2004**

Date	Time	Sample ID	Description	Depth (meters)	Temp degrees C	pH	DO (mg/L)	Cond (uS/cm)	Salinity (ppt)	Triclopyr (ppb)	Field Dup (ppb)
7/22/2004	12:40	004Bud.0722	Off Priest Point	0	20.8	8.3	8.27	29700	19	47.9*	
				1	20.48	8.1	8.15	42000	27		
7/22/2004	12:45	003Bud. 0722	Off Port Pennisula	0	20.22	8.2	8.4	33000	22	21.8	
				1	20.1	8.3	9.39	42000	27		
7/22/2004	12:55	002Bud.0722	Out from Port dock near Anthony's	0	20.4	8.2	7.97	33500	21	21.4	
				1	19.2	8.3	9.6	44000	28		

\* The Laboratory Method Blank sample had a concentration of 2.2 ppb.

**Day 6 – First Treatment**  
**July 25, 2004**

Date	Time	Sample ID	Description	Depth (meters)	Temp degrees C	pH	DO (mg/L)	Cond (uS/cm)	Salinity (ppt)	Triclopyr (ppb)
7/25/2004	10:20	012No.0725	Heritage Park	0	24.56	9.2	11.2	183	0.09	165
				1	24.57	9.2	11.3	183	0.09	
				2	23.54	8.9	11.26	215	0.1	
7/25/2004	10:30	006No.0725	Tide Gate	0	24.29	9.2	12.1	178	0.08	183
				2	24.27	9.2	12.13	177	0.08	
				4	22.79	8.2	10.34	10600	6	
				6	20.32	8	8.08	21400	12.9	
				7.5	19.53	7.8	6.47	21400	12.9	
7/25/2004	10:45	007No.0725	In front of brick house along Pkwy	0	24.04	9.3	13.87	177	0.08	186
				1	24	9.3	14	177	0.08	
				2	22.33	8.2	8.47	264	0.12	
7/25/2004	11:00	019Mid.0725	RR tressel in middle basin	0	24.22	9	11.62	160	0.07	231
				1	24.16	9	11.78	160	0.07	
				2	22.36	8.6	12.32	160	0.07	
				3	20.67	7.8	7.66	430	0.21	
7/25/2004	11:15	017Mid.0725	Across from Percival Cove near D. Pkwy	0	24.49	8.9	11.27	158	0.07	278
				1	24.40	9	12.06	156	0.07	
7/25/2004	11:25	020Mid.0725	So. of Pt.on W. shore near Interpretive Center	0	24.80	8	8.31	154	0.07	298
				0.6	24.57	8	8.82	154	0.07	
7/25/2004	11:35	013Mid.0725	Just north of I-5 bridge	0	24.20	8.7	10.73	153	0.07	240
				1	20.28	8.1	7.98	150	0.07	
7/25/2004	11:50	021So.0725	So. Basin by boat launch	0	22.30	7.8	8.52	151	0.07	152
				0.6	20.80	7.7	8.03	150	0.07	
7/25/2004	13:30	005Bud.0725	Northern-most site near Gull Harbor	0	21.4	8	13.9	42500	27	3
				1	19.5	8.1	14.9	43300	28	

**Continued**  
**Day 6 – First Treatment**  
**July 25, 2004**

Date	Time	Sample ID	Description	Depth (meters)	Temp degrees C	pH	DO (mg/L)	Cond (uS/cm)	Salinity (ppt)	Triclopyr (ppb)
7/25/2004	13:40	004Bud.0725	Off Priest Point	0	19.32	8.3	15.11	43500	28	1.8
				1	18.26	8.4	17.05	44800	29	
7/25/2004	13:50	003Bud.0725	Off Port Pennisula	0	20.26	8.2	13.53	42100	27	3.7
				1	17.25	8.3	15.75	44100	28	
7/25/2004	14:05	002Bud.0725	Out from Port dock near Anthony's	0	18.56	8.1	12.39	42600	27	6
				1	17.78	8.2	15.29	44000	28	

**Day 0 – Second Treatment**  
**July 29, 2004**

Date	Time	Sample ID	Description	Depth (meters)	Temp degrees C	pH	DO (mg/L)	Cond (uS/cm)	Salinity (ppt)	Triclopyr (ppb)
7/29/2004	15:30	010No.0729	Betw. W. WA arc and next viewing arc in wall	0	26.67	9.4	12.64	193	0.09	2330*
				1	25.11	9.4	14.1	190	0.09	
7/29/2004	15:40	012No.0729	Heritage Park	0	25.14	9.4	13.86	207	0.1	2450*
				1	24.12	9.4	14.81	202	0.09	
7/29/2004	15:50	006No.0729	Tide Gate	0	24.33	9.3	13.73	181	0.08	315*
				2	21.92	8.8	12.18	157	0.07	
				4	20.66	8.2	7.96	393	0.19	
				6	20.12	7.5	4.33	20,800	12.5	
				9	18.77	7.4	0.6	21,800	13	
7/29/2004	16:00	007No.0729	In front of brick house along Pkwy	0	26.18	9.3	13.38	180	0.08	1320*
				1	25.61	9.2	12.58	182	0.08	
				2	23.46	9	12.75	226	0.1	
7/29/2004	16:15	025No.0729	Middle of North Basin	0	25.44	9.2	13.38	176	0.08	776*
				1	25.22	9.2	12.99	176	0.08	
				2	22.16	8.6	10.99	155	0.07	
				3	20.57	8.3	9.55	191	0.09	
7/29/2004	14:40	023Bud.0729	Off 5th Avenue Bridge							65
7/29/2004	15:00	024Bud.0729	Oly Yacht Club; End of SW boat dock							54

\* The Laboratory Method Blank sample had a concentration of 2.2 ppb.

**Day 1 – Second Treatment**  
**July 30, 2004**

Date	Time	Sample ID	Description	Depth	Temp	pH	DO	Cond	Salinity	Triclopyr
				(meters)	degrees C		(mg/L)	(uS/cm)	(ppt)	(ppb)
7/30/2004	10:16	010No.0730	Betw. W. WA arc and next viewing arc in wall	0	23.82	9.2	12.14	198	0.09	831
				1	23.83	9.2	12.44	198	0.09	
7/30/2004	10:26	012No.0730	Heritage Park	0	23.7	9.2	11.42	203	0.1	1220
				1	23.7	9.2	11.52	203	0.1	
7/30/2004	10:33	006No.0730	Tide Gate	0	23.51	9.2	12.45	178	0.08	594
				2	23.49	9.2	12.35	178	0.08	
				4	20.82	7.9	6.29	1000	0.4	
				6	19.59	7.4	4.07	19,300	11.5	
				(bottom)						
7/30/2004	10:49	007No.0730	In front of brick house along Pkwy	0	23.88	9.2	13.06	180	0.08	877
				1	23.88	9.2	13.16	180	0.08	
				2	22.54	8.4	7.98	208	0.1	
7/30/2004	10:58	025No.0730	Middle of North Basin	0	23.68	9.2	12.67	175	0.08	782
				1	23.7	9.2	12.64	175	0.08	
				2	23.07	9	13.91	190	0.09	
				3	20.64	8.4	8.45	178	0.08	

**Day 14 – First Treatment**  
**Day 4 – Second Treatment**  
**August 2, 2004**

Date	Time	Sample ID	Description	Depth (meters)	Temp degrees C	pH	DO (mg/L)	Cond (uS/cm)	Salinity (ppt)	Triclopyr (ppb)
8/2/2004	11:05	010No.0802	Betw. W. WA arc and next viewing arc in wall	0	23.02	9.1	13.82	215	0.1	438
				1	22.69	9.2	14.1	209	0.1	
8/2/2004	11:20	012No.0802	Heritage Park	0	22.63	9.1	12.86	192	0.09	408
				1	22.39	9.1	12.06	226	0.1	
8/2/2004	11:30	006No.0802	Tide Gate	0	22.86	9.1	12.8	180	0.08	255
				2	22.5	9.1	12.68	180	0.08	
				4	21.33	8.2	9.45	12500	7	
				6	20.03	7.9	8.05	21000	12.6	
				8.4	20	7.9	8.1	21500	12.9	
8/2/2004	11:45	007No.0802	In front of brick house along Pkwy	0	23.18	9.2	12.98	192	0.09	283
				1	22.81	9.1	13.13	188	0.09	
				2	21.89	8.4	10.05	308	0.15	
8/2/2004	12:00	025No.0802	Middle of North Basin	0	22.95	8.9	11.92	176	0.08	225
				1	22.61	8.9	11.92	172	0.08	
				2	21.61	8.5	10.05	200	0.1	
				3	21	7.7	8.3	5000	3	
8/2/2004	11:00	019Mid.0802	RR tressel in middle basin	0	22.54	8.8	11.71	170	0.08	199
				1	22.51	8.8	11.6	169	0.08	
				2	21.48	8.4	10.36	166	0.08	
				3	20.94	7.8	9.04	6200	3.5	
8/2/2004	10:45	017Mid.0802	Across from Percival Cove near D. Pkwy	0	22.64	8.7	11.13	162	0.08	137
				1	22.63	8.7	11.11	162	0.08	

Date	Time	Sample ID	Description	Depth (meters)	Temp degrees C	pH	DO (mg/L)	Cond (uS/cm)	Salinity (ppt)	Triclopyr (ppb)
8/2/2004	10:35	020Mid.0802	So. of Pt.on W. shore near Interpretive Center	0 0.8	22.34 22.36	8.1 8.1	9.3 9.25	156 156	0.07 0.07	67.3
8/2/2004	10:25	013Mid.0802	Just north of I-5 bridge	0 1	21.82 19.9	8.4 7.9	10.16 7.27	155 151	0.07 0.07	35.6
8/2/2004	10:15	021So.0802	So. Basin by boat launch	0	20.91	8.6	8.61	157	0.07	28.8
8/2/2004	8:55	005Bud.0802	Northern-most site near Gull Harbor	0 1	19.68 19.25	7.9 8	11.18 11.74	41100 43700	26 28	18.1
8/2/2004	9:05	004Bud.0802	Off Priest Point	0 1	20.07 19.91	8.1 8.2	10.61 11.65	39700 42000	25 27	21.2
8/2/2004	9:15	003Bud.0802	Off Port Pennisula	0 1	20.09 19.35	8.1 8.2	10.81 11.89	39700 44100	26 29	21
8/2/2004	9:20	002Bud.0802	Out from Port dock near Anthony's	0 1	20.27 19.5	8.1 8.1	10.52 11.29	40800 43400	26 28	26.9

## Day 7 – Second Treatment

August 5, 2004

Date	Time	Sample ID	Description	Depth (meters)	Temp degrees C	pH	DO (mg/L)	Cond (uS/cm)	Salinity (ppt)	Triclopyr (ppb)	Field Dup (ppb)
8/5/2004	11:20	010No.0805	Betw. W. WA arc and next viewing arc in wall	0	22.3	9	11.41	257	0.12	283	
				1	21.63	9.1	11.54	249	0.12		
				2	21.71	8.4	9.61	915	0.45		
8/5/2004	11:35	012No.0805	Heritage Park	0	21.95	9.2	13.01	291	0.14	187	
				1	21.83	9.1	12.62	288	0.14		
				2	21.53	8.7	10.15	344	0.17		
8/5/2004	11:50	006No.0805	Tide Gate	0	21.78	9.1	13.15	303	0.14	158	
				1	21.77	9.1	13.05	303	0.14		
				2	21.7	9.1	12.89	302	0.14		
				4	20.88	7.8	7.23	12800	7.36		
				5	20.71	7.8	7.19	13800	8		
				5.3 (bottom)							
8/5/2004	12:15	007No.0805	In front of brick house along Pkwy	0	22.33	8.9	11.61	205	0.1	191	
				1	21.7	8.9	11.87	223	0.11		
				2	20.56	7.8	2.22	764	0.35		
8/5/2004	12:25	025No.0805	Middle of North Basin	0	21.92	8.7	11.3	225	0.11	115	110
				1	21.86	8.8	11.22	223	0.11		
				2	21	8.5	10.6	500	0.22		
				2.7	20.58	7.9	8.19	3200	1.7		
8/5/2004	10:15	005Bud.0805	Northern-most site near Gull Harbor	0	18.14	7.4	9.73	40800	26	11	
				1	18.02	7.6	10.26	42000	27		
8/5/2004	10:30	004Bud.0805	Off Priest Point	0	17.89	7.8	9.61	40500	24	25.3	
				1	18.31	8	11.71	44100	29		
8/5/2004	10:35	003Bud.0805	Off Port Pennisula	0	17.34	7.8	9.47	43300	28	5.2	
				1	17.07	7.9	9.56	44000	28		

**Continued**  
**Day 7 – Second Treatment**  
**August 5, 2004**

Date	Time	Sample ID	Description	Depth (meters)	Temp degrees C	pH	DO (mg/L)	Cond (uS/cm)	Salinity (ppt)	Triclopyr (ppb)	Field Dup
8/5/2004	10:45	002Bud.0805	Out from Port dock near Anthony's	0	17.63	7.8	8.84	43200	28	5.6	
				1	17.31	7.8	8.7	44000	28		

**Day 14 – Second Treatment**  
**August 12, 2004**

Date	Time	Sample ID	Description	Depth	Temp	pH	DO	Cond	Salinity	Triclopyr	Field Dup
				(meters)	degrees C		(mg/L)	(uS/cm)	(ppt)	(ppb)	(ppb)
8/12/2004	8:45	010No.0812	Betw. W. WA arc and next viewing arc in wall	0	23.69	10	17.72	277	0.13	46.8	
				1	23.25	9.7	16.86	300	0.14		
				2	21	8.8	11.12	700	0.34		
8/12/2004	8:55	012No.0812	Heritage Park	0	23.22	10	19.34	297	0.14	60	
				1	22.98	10	18.62	285	0.14		
				2	20.64	8.9	10.87	328	0.16		
8/12/2004	9:05	006No.0812	Tide Gate	0	23.8	10	18.1	266	0.13	39.7	
				2	20.4	8.8	11.84	166	0.08		
				4	19.42	8.2	9	255	0.12		
				6	18.9	7.2	3.16	21700	13		
				7	18.89	7.3	2.22	22000	13		
8/12/2004	9:20	007No.0812	In front of brick house along Pkwy	0	23.8	9.9	17.7	261	0.12	39.3	
				1	22.63	9.2	13.06	297	0.14		
				2	20.86	8.5	9.65	690	0.34		
8/12/2004	9:30	025No.0812	Middle of North Basin	0	23.69	9.7	16.9	232	0.11	28.3	
				1	23.28	9.9	17.19	266	0.13		
				2	19.89	8.5	9.37	176	0.08		
				2.6	19.55	8.2	8.43	236	0.11		
8/12/2004	7:35	005Bud.0812	Northern-most site near Gull Harbor	0	21.33	7.9	11.62	39800	25	2	
				1	20.5	8.2	15.74	44100	29		
8/12/2004	7:45	004Bud.0812	Off Priest Point	0	20.15	8.2	10.57	36800	23	2.8	
				1	20.02	8.3	14.79	44300	29		
8/12/2004	7:50	003Bud.0812	Off Port Peninsula	0	19.39	8.2	11.39	33900	22	4.5	
				1	22.49	8.4	13.14	42600	27		

**Continued**  
**Day 14 – Second Treatment**  
**August 12, 2004**

<b>Date</b>	<b>Time</b>	<b>Sample ID</b>	<b>Description</b>	<b>Depth</b>	<b>Temp</b>	<b>pH</b>	<b>DO</b>	<b>Cond</b>	<b>Salinity</b>	<b>Triclopyr</b>	<b>Field Dup</b>
				(meters)	degrees C		(mg/L)	(uS/cm)	(ppt)	(ppb)	(ppb)
8/12/2004	8:05	002Bud.0812	Out from Port dock near Anthony's	0	19.81	8.3	11.19	25600	16	8.5	
				1	19.09	8.2	12.5	42300	27		

**Post-Treatment Sediment and Ground Water Results**

Date	Time	Sample ID	Description	Temp degrees C	pH	DO (mg/L)	Cond (uS/cm)	Triclopyr (ppb)	% Solids	SWL (feet)
8/25/2004	9:00	MW60825	Heritage Pk monitoring well # 6	14.98	7.2	4.54	723	ND		5.14
8/23/2004	11:10-11:35	NOW0823	Sediment composite from north basin west shore					330	32.3	
8/23/2004	10:30-11:00	NOE0823	Sediment composite from north basin east shore					690	26.7	
8/23/2004	12:20-12:55	MidE0823	Sediment composite from middle basin east shore					55	36.6	
8/23/2004	11:45-12:15	MidW0823	Sediment composite from middle basin west shore					140	29.8	